

Technical Datasheet

SilOil M40.165/200.10

Type/Use

SilOil M40.165/200.10 is a low-viscosity silicone fluid which, as a result of its special property profile, is particularly suitable for use as a cold and heat transfer medium in cryostats, thermostats and heat transfer installations.

Properties

In chemical terms, **SilOil M40.165/200.10** is a linear polydimethyl siloxane (PDMS), characterised by the following properties:

- virtual insolubility in water
- non-corrosiveness
- low setting points and vapour pressures
- high flash points
- low toxicity
- odourlessness
- no coking tendency under thermal stress
- high thermal stability
- resistance to ageing
- no chlorine

These properties can particularly be exploited in cases where high demands are made on the quality of a cold or heat transfer medium as regards its environmental compatibility.

Applications

SilOil M40.165/200.10 can be used in the range from -40 °C to +165 °C and to +200 °C in connection with externally sealed systems (for Unistat).

It should be borne in mind that, at high temperatures, **SilOil M40.165/200.10** can likewise be chemically altered by oxidising media, such as air, or substances with a catalytic effect, such as acids, lyes and various metal compounds. An increase in viscosity, and possibly even gelling of the fluid owing to cross-linking reactions, must be expected in the presence of oxidising agents, while contact with products having a catalytic effect usually induces a process of depolymerisation, resulting in a drop in viscosity.

Notes on use

SilOil M40.165/200.10 can absorb about 200 ppm water at room temperature, but it is shipped with a maximum water content of 50 ppm. A silicone fluid with such low water contents are thus hygroscopic and absorbs moisture from the air relatively quickly when stored in open containers or used in open systems. Part of this absorbed moisture is eliminated again upon cooling of the fluid which can then lead to gradual thickening of the cold fluid and deterioration of the heat transfer. It is thus important to ensure that no moisture comes into contact with the fluid or can penetrate the system, specifically when using **SilOil M40.165/200.10** in refrigeration systems.

Effect on materials

SilOil M40.165/200.10 does not attack metals and is, in turn, not attacked by metals. It is similar with sealing materials: the sealing materials commonly used in cold and heat transfer installations are virtually not affected by **SilOil M40.165/200.10** at all.

Tests involving various sealing materials in 7-day contact with **SilOil M40.165/200.10** at 50 °C have revealed that no effects worthy of note can be observed in the case of chloroprene rubber (Baypren®), butadieneacrylonitrile rubber (Perbunan N®), ethylenevinylacetate rubber (Levapren®) and fluorinated rubber (Viton®). One exception which should be mentioned is that silicone rubber alone is subject to severe swelling.

Storage

SilOil M40.165/200.10 has a shelf life of at least 2 years if stored correctly (in closed containers, protected against wetness, cold and direct sunlight).

Technical Data

Chemical name:	polydimethyl siloxane
Appearance:	colourless, clear fluid
Vapour pressure at 80°C:	approx. 1 mbar
Water content:	≤ 50 ppm
Refractive index at 25°C:	1,398
Setting point (DIN 51597):	< -90°C
Flash point (DIN 51376):	> +170°C
Burning point (DIN 51376)	> +230°C
Ignition temperature (DIN 51794):	> +400°C
Mean coefficient of cubic expansion [10–5/K]:	103

Viscosity

	Viscosity [mm ² /s]	Specific heat [J/g · K]
-60°C	110	1,470
-40°C	50	1,500
-20°C	27	1,530
0°C	17	1,560
+25°C	10	1,597
+40°C	7,9	1,618
+80°C	4,7	1,680
+120°C	3,0	1,737
+160°C	2,2	1,797
+200°C	1,8	1,856
+240°C	1,5	1,915

Thermal conductivity

	Thermal conductivity [W/K · m]	Density [g/cm ³]
-60°C	0,165	1,015
-40°C	0,159	0,997
-20°C	0,154	0,978
0°C	0,148	0,960
+25°C	0,142	0,938
+40°C	0,136	0,925
+80°C	0,125	0,888
+120°C	0,114	0,853
+160°C	0,103	0,817
+200°C	0,091	0,780
+240°C	0,080	0,745



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high precision thermoregulation

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